that are structurally related to flavonoids have recently been indicated to be harmful on animal or human consumption. The biochemical mechanism of the mode of action of flavonoids and aromatic metabolites in herbs and spices will be discussed.

doi:10.1016/j.sajb.2016.02.003

Ten years of plant DNA barcoding at the African Centre for DNA Barcoding

M. Van der Bank[a], B.H. Daru[b], O. Maurin[a], B.S. Bezeng[a], K. Yessoufou[c]
[a]*African Centre for DNA Barcoding, University of Johannesburg, PO Box 524, Auckland Park, Johannesburg 2006, South Africa*
[b]*Department of Plant Science, University of Pretoria, Private Bag X20, Hatfield 0028, South Africa*
[c]*Department of Environmental Sciences, University of South Africa, Private Bag X6, Florida Campus, Johannesburg 1710, South Africa*

Following the evaluation of several candidate loci, the Plant Working Group of the Consortium for the Barcoding of Life recommended, in 2009, that the two plastid genes, *rbcLa* and *matK*, be adopted as the core DNA barcodes for terrestrial plants. To date, numerous studies continue to test the discriminatory power of these markers across various plant lineages. While some barcoding studies did not even include these markers as candidates, we, at the African Centre for DNA Barcoding, have consistently utilised these markers over the past decade. To date more than 15,000 plant barcodes of southern African native plants have been archived on the Barcode of Life Database. Building upon this solid foundation and database, we addressed questions varying along different axes including community assembly processes, biogeography, phylogenetic diversification, and invasion biology. Furthermore, consistent marker usage has found real-world application in surveying medicinal plants and monitoring trade of endangered species. Several milestones will be discussed and recommendations specific to South Africa outlined.

doi:10.1016/j.sajb.2016.02.004

Invasion science for society: Challenges and opportunities in South Africa

D.M. Richardson
Centre for Invasion Biology, Department of Botany and Zoology, Stellenbosch University, Private Bag X1, Matieland 7602, South Africa

Biological invasions pose a huge and rapidly growing threat to South Africa's biodiversity and the many services that are derived from terrestrial, marine and freshwater ecosystems. Substantial advances have been made in understanding many aspects of biological invasions in recent decades, but substantial challenges remain in applying such knowledge to deal with the many facets of invasions. “Invasion science” is a rapidly growing field – it embraces invasion ecology, but increasingly involves non-biological lines of enquiry, including economics, ethics, sociology, and inter- and transdisciplinary studies. This presentation discusses some key innovations in invasion science globally and sets out some key challenges and opportunities for the field in the South African context, with an emphasis on plants.

doi:10.1016/j.sajb.2016.02.005

The role of palynology in multidisciplinary research on past environments in southern Africa

L. Scott
Department of Plant Sciences, University of the Free State, PO Box 339, Bloemfontein 9300, South Africa

Depending on different time scales, fossil pollen studies can be applied in research on climate change, plant evolution, biome origins, ecology, anthropogenic influences and conservation biology. Interpretations of plant distributions during the Quaternary or earlier periods in terms of vegetation changes and past circulation patterns have limitations such as the scarcity of suitable deposits for fossil pollen preservation or the low taxonomic level of pollen identification that is usually wider than species level. To support environmental reconstructions palynological research also has to rely on multidisciplinary aspects like biogeochemistry, dating methods and various other proxies of palaeoclimate. Despite constraints, examples of this research from southern Africa show progress, but expose gaps that should guide future research e.g., through maintaining reference pollen material and monitoring modern pollen production. This should serve as control for interpretations of past conditions but can also help to identify vegetation or climate patterns that have no modern analogues. Explanations of observed pollen or plant distributions in southern Africa in terms of regional forcing mechanisms remain challenging especially in different environmental contexts like ocean, lake and terrestrial deposits. Since there will always be large gaps in the fossil pollen record from this relatively dry region, reconstructions should eventually rely on simulations of global climate forcing that can best be tested by means of a closer grid of fossil pollen sequences than is currently available.

doi:10.1016/j.sajb.2016.02.006

Linking root traits to superior phosphorus uptake and utilization efficiency in Fabales in the Core Cape Subregion, South Africa

D. Basic, A.M. Muasya, S.B.M. Chimphango
Department of Biological Sciences, HW Pearson Building, University of Cape Town, Private Bag X3, Rondebosch 7701, South Africa

Within the Core Cape Subregion, due to the highly weathered and nutrient leached soil substrates and subsequent low P availability, plants have evolved a number of enhanced P-acquisition and utilization mechanisms, both morphological and physiological. It was hypothesized that plants grown in low P soils would produce greater P-acquisition mechanisms and that *Aspalathus linearis*, a cluster root forming species that is adapted to drier and more infertile soils, would be the most efficient at P-acquisition. Three Fabales species were studied, two legume species: *A. linearis* and *Podalyria calyptrata* and one non-legume species: *Polygala myrtifolia*, in a glasshouse experiment. Plants were grown for nine months in three soil types with varying P levels. At harvest, biomass accumulation, P-acquisition mechanisms and foliar nutrients were assessed. *P. myrtifolia* was superior in the most number of traits for enhanced P-acquisition and developed a root system with better morphological characteristics that exuded greater citric acid and exhibited a greater whole plant P acquisition than both *P. calyptrata* and *A. linearis*. However, *P. calyptrata* was found to be the most efficient at P use likely due to having the highest N content supplemented by its ability to nodulate and fix N.

doi:10.1016/j.sajb.2016.02.007